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IS 9022 (1979): Methods for preparation of laboratory test samples and test specimens of textile materials for chemical testing [TXD 5: Chemical Methods of Test]

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Indian Standard

METHODS FOR

PREPARATION OF LABORATORY TEST SAMPLES AND TEST SPECIMENS OF TEXTILE MATERIALS FOR CHEMICAL TESTING

UDC 677.06 : 677.014.23 [543.05]



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INDIAN STANDARDS INSTITUTION
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Indian Standard

METHODS FOR PREPARATION OF LABORATORY TEST SAMPLES AND TEST SPECIMENS OF TEXTILE MATERIALS FOR CHEMICAL TESTING

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Indian Standard

METHODS FOR
PREPARATION OF LABORATORY TEST
SAMPLES AND TEST SPECIMENS OF TEXTILE
MATERIALS FOR CHEMICAL TESTING

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 10 January 1979, after the draft finalized by the Chemical Methods of Test Sectional Committee had been approved by the Textile Division Council.

0.2 This standard prescribes the methods in which the laboratory test samples are obtained by the combination of numerous small portions each drawn from a different part of the laboratory bulk sample. Therefore, any results obtained on test specimens from these samples will estimate the mean level in the laboratory bulk sample but will not indicate the variability of level from portion to portion of the laboratory bulk sample. Consequently it is appropriate to use this method in cases where it is desired to estimate the bulk composition, for example, the proportions of different fibres in a blend, but it is not appropriate in cases where variability is important, for example, in the determination of *pH* where the local value is significant, or in the determination of fungicides, where a high value in one area of the material does not compensate for low value elsewhere. Also, it may not be appropriate for use in determination of commercial mass values.

0.3 This standard is generally based on ISO 5089-1977 Textiles — Preparation of laboratory test samples and test specimens for chemical testing, issued by the International Organization for Standardization.

0.4 In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

*Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard specifies methods of obtaining laboratory test samples of textile materials from laboratory bulk samples taken from a bulk source and gives general directions for the preparation of test specimens of convenient size for chemical tests.

1.2 No provision for sampling from the bulk source is described since it is assumed that the laboratory bulk sample has been selected by a suitable procedure and is representative of the bulk source.

2. DEFINITIONS

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Bulk Source — That quantity of material which is to be judged on the basis of one series of test results. This may comprise, for example, all the material in one delivery of cloth; all the cloth woven from a particular beam; a consignment of yarn; a bale or a group of bales of raw fibre.

2.2 Laboratory Bulk Sample — That portion of the bulk source taken to be representative of the whole. The size and nature of the laboratory bulk sample should be sufficient to overcome adequately the variability of the bulk source and to facilitate ease of handling in the laboratory.

2.3 Laboratory Test Sample — That portion of the laboratory bulk sample from which specimens are taken for testing. The size and nature of the laboratory test sample should be sufficient to overcome adequately the variability of the laboratory bulk sample.

2.4 Test Specimen — The portion of material required to give an individual test result.

3. PRINCIPLE

3.1 The laboratory test sample is taken so that it is representative of the laboratory bulk sample. The test specimens are taken from the laboratory test sample in such a way that each of them is representative of the laboratory test sample.

4. SAMPLING OF LOOSE FIBRES

4.1 Non-oriented Fibres

4.1.1 If the laboratory bulk sample consists of less than 5 kg of loose fibre, spread it out in an even layer. Obtain the laboratory test sample by taking at random a minimum of 100 tufts of approximately equal size, the total mass being sufficient to give a laboratory test sample of required size.

4.1.2 If the laboratory bulk sample is greater than 5 kg, divide it into a number of equal portions, and take an equal number of tufts of suitable mass from each portion such that the total number from all portions exceed 100.

4.1.3 Pretreat the laboratory test sample, if required, by the test method to be used. From the laboratory test sample remove at random, using forceps, small tufts of approximately equal mass to give a test specimen of the mass required.

4.2 Oriented Fibres (Card Webs, Slivers, Rovings) — From randomly selected parts of the laboratory bulk sample cut not less than ten cross sections each weighing approximately 1 g. After applying pretreatment, if necessary, lay the cross-sections together and obtain the test specimen by cutting through them so as to take a portion of each of the ten lengths.

5. SAMPLING OF YARN

5.1 Yarn in Packages or in Hanks

5.1.1 If the number of packages in the laboratory bulk sample is 25 or less, sample all the packages. If the number exceeds 25, take 25 packages at random. If the linear density of the yarn, expressed in tex, is t , and the number of packages taken from the laboratory bulk sample is n , the length of yarn from each package to give a 10 g laboratory test sample is:

$$\frac{10^6}{n \times t} \text{ cm}$$

if $n \times t$ is high, for example, more than 2 000, wind a heavier skein and cut it across in two places to make a tow of suitable mass.

5.1.2 Withdraw the appropriate continuous length from each package either by winding skeins of the same number of turns on a wrap reel (*see Note*) or by some other means. Unite the length side by side either as a single skein or as a tow to form the laboratory test sample, ensuring that there are equal lengths from each package in the skein or tow. Pretreat the laboratory test sample, if required, by a suitable method and ensure that the ends of any sample in the form of tow are securely tied before treatment.

NOTE — If the packages can be mounted in a convenient creel a number can be wound simultaneously.

5.1.3 Take specimens of the appropriate mass from the laboratory test sample by cutting a bunch of threads of equal length from the skein or tow and comprising all the threads in it, ensuring that test specimens are taken from a place remote from the tie bands.

5.2 Yarn on Warp

5.2.1 Take the laboratory test sample by cutting a length from the end of the warp, not less than 20 cm long and comprising all the yarns in the warp except the selvedge yarns, which are rejected. Tie the bunch of threads together near one end. If the sample is too large for any required pretreatment, divide it into two or more portions, each portion tied together separately for pretreatment. Reunite the portions after the pretreatment.

5.2.2 Take a test specimen by cutting a suitable length from the laboratory test sample from the end remote from the tie band, and comprising all the threads in the warp. For warp of N threads of tex t , the length of a specimen of mass 1 g is:

$$\frac{10^5}{N \times t} \text{ cm}$$

6. SAMPLING OF FABRIC

6.1 From a Laboratory Bulk Sample Consisting of a Single Cutting Up to 1 m in Length

6.1.1 Cut a diagonal strip from corner to corner and remove the selvedges. For a laboratory test sample of X g the area of the strip required is:

$$\frac{X \times 10^4}{M} \text{ cm}^2$$

where M is the mass of the cloth in grams per square metre.

6.1.2 This area divided by the length of the diagonal in centimetres will give the required width of strip in centimetres.

6.1.3 After subjecting the strip to any pretreatment, cut it across its length into four equal lengths and superimpose them. Take test specimens from any part of the layered material by cutting through all the layers in such a way that each specimen comprises an equal length from each layer.

6.2 From a Laboratory Bulk Sample Consisting of a Single Cutting More Than 1 m in Length — Take two full-width cuttings, one from each end of the laboratory bulk sample and not more than 1 m long. Cut both into two equal portions by a cut parallel to the warp direction and mark the right-hand and left-hand halves of each. Put the right-hand half of one cutting to the left-hand half of the other, with the cut edges together, and cut a diagonal strip from the lower corner of one cutting to the upper corner of the other, after removing the selvedges. Proceed as in **6.1**, treating the two half-width diagonal strips as if they were a full-width continuous strip.

6.3 From a Laboratory Bulk Sample Consisting of Several Cuttings — Treat each cutting separately as described in 6.1 or 6.2 and give results for each cutting in the test report.

6.4 From a Fabric with a Design Arising from the Distribution of Threads

6.4.1 Ensure, if possible, that there is an integral number of complete repeats of the design in the laboratory bulk sample and proceed as in 6.1 unless the laboratory bulk sample so obtained is more than 1 m in length in which case proceed as in 6.2. Where the pattern repeat is large and/or asymmetric, the entire strip should be cut into small fragments, thoroughly mixed and then sampled by the procedure indicated in 4.1.

6.4.2 Where the laboratory bulk sample does not contain at least one complete repeat of the design, report this under 8.1(b).

7. SAMPLING OF MADE-UP ARTICLES

7.1 The laboratory bulk sample normally consists of a complete made-up article or a representative part of such an article.

7.2 Determine whether all parts of the article are of similar composition; if so, treat the whole article as a laboratory bulk sample, and take a laboratory test sample representative of the laboratory bulk sample.

7.3 If parts of the article are of different composition, separate the parts and treat each as the laboratory bulk sample and take a laboratory test sample representative of the laboratory bulk sample.

8. TEST REPORT

8.1 The test report should include the following information:

- a) A statement that the material was sampled in accordance with this standard,
- b) The size of the laboratory bulk sample (*see also 6.4.2*),
- c) The size of the laboratory test sample, and
- d) The size of the test specimen.

INDIAN STANDARDS

ON

CHEMICAL METHODS OF TEST FOR QUANTITATIVE CHEMICAL ANALYSIS OF FIBRE MIXTURES

IS:

- 667-1955 Simple methods for identification of common commercial textile fibres
- 1564-1962 Method for quantitative chemical analysis of binary mixtures of cellulose triacetate and certain other fibres
- 1889 Method for quantitative chemical analysis of binary mixtures of regenerated cellulose fibres and cotton:
 - 1889 (Part I)-1976 Sodium zincate method (*first revision*)
 - 1889 (Part II)-1976 Cadoxen solvent method
- 2005-1962 Method for quantitative chemical analysis of binary mixtures of polyamide fibres and certain other fibres
- 2006-1978 Method for quantitative chemical analysis of binary mixtures of protein fibres and certain other fibres (*first revision*)
- 2176-1962 Method for quantitative chemical analysis of binary mixtures of secondary cellulose acetate and certain other fibres
- 2177-1962 Method for quantitative chemical analysis of mixtures of cellulose triacetate and secondary cellulose acetate fibres
- 2727-1964 Method for quantitative chemical analysis of binary mixtures of manila and sisal fibres
- 3416-1966 Method for quantitative chemical analysis of mixtures of polyester fibres with cotton or regenerated cellulose
- 3421-1966 Method for quantitative chemical analysis of binary mixtures of acrylic and certain other fibres
- 6503-1972 Method for quantitative chemical analysis of ternary mixtures of protein fibres, nylon 6 or nylon 6·6, and certain other fibres
- 6504-1972 Method for quantitative chemical analysis of ternary mixtures of viscose rayon, cotton and protein fibres
- 6570-1972 Method for quantitative chemical analysis of binary mixtures of jute and animal fibres